भारतीय मानक
Indian Standard

IS 1967 : 2022

सूती कपड़ों में डिसाइज़िंग के बाद अवशिष्ट स्टार्च के आकलन की विधि

(पहला पुनरीक्षण)

Method for Estimation of Residual Starch in Cotton Fabrics after Desizing

(First Revision)

ICS 59.060.01

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Chemical Methods of Test Sectional Committee, TXD 05

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards after the draft finalized by the Chemical Methods of Test Sectional Committee had been approved by the Textiles Division Council.

This standard was originally published in 1961. The first revision has been made in the light of experience gained since its publication and to incorporate the following major changes:

a) Apparatus as per the testing procedure has been updated; and

b) References to Indian Standard has been updated.

Starch is applied to warp yarn during the sizing operation, prior to weaving. In order to obtain efficient results in bleaching, dyeing, printing and other finishing treatments, it is essential that starch and other ingredients of size present in grey cloth and also the natural non-cellulosic impurities in cotton are removed completely. Such a removal is accomplished in the processes of desizing and scouring. Desizing is done by steeping the cloth either in water or in dilute mineral acid or more advantageously, by treatment with amylolytic enzymes. Efficient desizing would remove more than 90 percent of the starch present. Starch, if not removed to this extent, will interfere with the efficiency of kiering, yielding degradation products with reducing properties; these products would act detrimentally especially on coloured yarns if they are present in the material under treatment. Hence, a routine test to determine the quality of residual starch in the desized cloth is very necessary.

The composition of the Committee responsible for the formulation of this standard is given in Annex B.

In reporting the result of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'.

Indian Standard

METHOD FOR ESTIMATION OF RESIDUAL STARCH IN COTTON FABRICS AFTER DESIZING

(First Revision)

1 SCOPE

This standard prescribes a method for the estimation of residual starch in cotton fabrics.

2 REFERENCES

The standards listed in Annex A contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated in Annex A.

3 SAMPLING

3.1 Sample to estimate the amount of residual starch in cotton material in a lot shall be selected so as to be representative of the lot.

3.2 Sample drawn in compliance with an agreement between the buyer and the seller to estimate the starch present in the material in the lot shall be held to be representative of the lot.

4 TEST SPECIMENS

4.1 From the sample under analysis (*see* **3.1** and **3.2**) draw a piece weighing about 10 g. Shred the piece into small bits and mix them thoroughly.

4.2 Draw, from the pieces so shredded, at least five test specimens each weighing about one gram.

5 DETERMINATION OF MOISTURE CONTENT, PERCENT

5.1 Take a test specimen (*see* **4.2**), determine its moisture content by the method prescribed in **6** or IS 199.

5.2 Repeat the procedure on another test specimen (*see* **4.2**).

5.3 Calculate the average of the two values (*see* **5.1** and **5.2**).

6 PREPARATION OF THE EXTRACT

6.1 Take a test specimen (*see* **4.2**). Weigh it accurately. Boil it in about 150 ml of distilled water in a conical flask for about 45 min. Cool the contents in the flask and decant the supernatant liquid into a beaker.

NOTE — It would be advantageous to carry out the procedures prescribed in **5** and **6** simultaneously.

6.2 Add about 25 ml of distilled water to the residue in the conical flask and boil it for 30 min. Decant the supernatant liquid into the beaker.

6.3 Put a drop of iodine solution on the residue in the conical flask. Observe whether there is any appearance of blue colour.

6.4 Take the residue in the conical flask to be free from all starch if no blue colour is observed (*see* Note).

NOTE — If, however, blue colour is observed, repeat as many times as may be necessary the procedure prescribed in **6.2**.

6.5 Filter the decanted liquor twice through a G-3 size sintered glass crucible. Concentrate the filtrate by boiling, cool to room temperature and make up the volume to 100 ml.

7 ESTIMATION OF STARCH

7.1 Apparatus

7.1.1. 250 ml *Conical Flasks,* two.

7.1.2 *Reflux Condenser*

7.1.3 *Analytical Balance*, with an accuracy of 0.001 g.

7.1.4 *Pipettes*, of 5 ml and 10 ml in capacity.

7.1.5 *Volumetric Flask,* of 25 ml and 100 ml.

7.2 Reagents

7.2.1 *Solution A, Potassium Dichromate Solution* — Approximately 0.5 N, but not greater than 0.5 N, containing 24.5 g of potassium dichromate ($K_2Cr_2O_7$) and 300 ml of concentrated sulphuric acid per litre of the solution.

7.2.2 *Solution B, Ferrous Ammonium Sulphate Solution* — Slightly greater than 0.1 N, but accurately standardized, containing 39.5 to 40 g of ferrous ammonium sulphate crystals [$FeSO_4.(NH_4)_2SO_4.6H_2O$] and 20 ml of concentrated sulphuric acid per litre of the solution.

7.2.3 *Phenyl Anthranilic Acid Indicator* — Prepared by dissolving 0.13 g of anhydrous sodium carbonate in a small quantity of hot water, and dissolving in this solution 0.26 g of phenyl anthranilic acid and making up the volume to 250 ml.

7.3 Procedure

Transfer 25 ml of the extract (*see* **6.5**) into a 230-ml flask. Add to this, 10 ml of solution *A* (*see* **7.2.1**) and 5 ml of concentrated sulphuric acid. Boil the mixture under reflux for one hour. Cool the contents, make up the volume to 100 ml. Titrate the solution against solution *B* (*see* **7.2.2)** adding 6 to 8 drops of the indicator towards the end of the titration (*see* Note).

NOTE — Appearance of characteristic green colour indicates the completion of the titration.

7.4 Carry out a blank simultaneously following the procedure prescribed in **7.3** but taking 25 ml of distilled water instead of the extract.

7.5 Calculate the oven-dry weight of the specimen by the formula given below:

$$\text{Oven-dry weight, in g,} = w - \frac{w \times m}{100}$$

where

w = weight in g, of the specimen taken (*see* **6.1**); and

m = moisture content, percent, as calculated (*see* **5.3**).

7.6 Calculate the percentage of starch present in the specimen by the following formula:

$$\text{Percent of starch} = \frac{400 \times (v_1 - v_2)\, N \times 0.006\,96}{w}$$

where

v_1 = volume in ml, of solution *B* required for blank (*see* **7.4**);

v_2 = volume in ml, of solution *B* required for the extract (*see* **7.3**);

N = normality of solution *B*; *and*

W = oven-dry weight, in g, of the specimen as calculated (*see* **7.5**).

NOTE — One millilitre of 1N potassium dichromate corresponds to 0.006 96 g of starch.

7.7 Repeat the procedure prescribed in **5** and **6** with the remaining specimens. Calculate the average of all the values.

8 REPORT

Report the average as obtained in **7.7** as the percentage of starch present in the sample.

ANNEX A

(*Clause* 2)

LIST OF REFERRED INDIAN STANDARDS

IS No.	*Title*
199 : 1989	Textiles — Estimation of moisture, total size or finish, ash and fatty matter in grey and finished cotton textile materials (*third revision*)

ANNEX B

(*Foreword*)

COMMITTEE COMPOSITION

Chemical Methods of Test Sectional Committee, TXD 05

Organization	*Representative(s)*
The Synthetic and Art Silk Mills Research Association, Mumbai	Dr Manisha Mathur (***Chairman***)
Ahmedabad Textile Industry's Research Association, Ahmedabad	Shrimati Deepali Plawat Shri Jigar Dave (*Alternate*)
Bidhata Industries Pvt Ltd, Mumbai	Shri Rohit Pacheriwala R. K. Pacheriwala (*Alternate*)
Directorate General of Quality Assurance (CQAT & C), Kanpur	Shri Anuj Kumar Shukla Shri S. J. Kolarkar (*Alternate*)
Global Organic Textile Standard, Thane	Shri Rahul Bhajekar Shrimati Prachi Gupta (*Alternate*)
ICAR- Central Institute for Research on Cotton Technology, Mumbai	Dr Sujata Saxena Dr A. S. M. Raja (*Alternate*)
In Personal Capacity	Shri B. S. Acharya
Intertek India Private Limited, Mumbai	Shri Narayan B. Borade Shri Milind R. Marathe (*Alternate*)
Northern India Textile Research Association, Ghaziabad	Dr M. S. Parmar Dr A. A. Ansari (*Alternate*)
Office of the Textile Commissioner, Mumbai	Shri Gaurav Gupta Shri Sanjay Charak (*Alternate*)
Raymonds Ltd, Mumbai	Shri Prabhat Parasher Shri Saurav Shekhar (*Alternate*)
Reliance Industries Ltd, New Delhi	Shri M. S. Verma Shri Mahesh C. Sharma (*Alternate*)
S G S, Mumbai	Dr Karthikeyan K. Shri Michael Francis (*Alternate*)
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Testtex India Laboratories Pvt Ltd, Mumbai	Shrimati Meeta Shingala Shri Mahesh Sharma (*Alternate*)
Texanlab Laboratoires Pvt Ltd, Navi Mumbai	Shri Milind R. Marathe Shri Vivek Patil (*Alternate*)
Textiles Committee, Mumbai	Shri Kartikay Dhanda Dr P. Ravichandran (*Alternate*)
The Bombay Textile Research Association, Mumbai	Shri M. P. Satyanarayan Shrimati Saroj Vairagi (*Alternate*)
The Synthetic and Art Silk Mills Research Association, Mumbai	Shrimati Ashwini A. Sudam Shrimati Leena Mhatre (*Alternate*)
U P Textile Technology Institute	Dr Arun Kumar Patra Dr Subhankar Maity (*Alternate*)

Organization	*Representative(s)*
Venture Instrumentation Technologies Pvt Ltd, Bengaluru	Shri Vishal Vijay Babu Shri Nagaraj C. (*Alternate*)
Wool Research Association, Thane	Dr Mrinal Choudhari Shrimati Samita Bait (*Alternate*)
BIS Directorate General	Shri J. K. Gupta, Scientist 'E' and Head (Textiles) [Representing Director General (*Ex-officio*)]

Member Secretary

Shri Dharmbeer
Scientist 'C' (Textiles), BIS

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